Title:	Production Qualification Training Course 4 of 8 Product Definition Authorization
Author(s):	Gonzalez, Stephanie
Intended for:	Training Course
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Production Qualification Training
Course 4 of 8

Product Definition Authorization

Joint Initiative: W-8 Group and ALDW-DAQ

Curriculum Overview

This curriculum is intended to:

- Teach you about the Product Definition Authorization
- Explain the course subject in detail
- Provide references and guides that will help beyond this training

Utrain Course	Procedure	Title	Course #
RR 49297	W-SE-0008	Engineering Authorization System	Course 1
RR 49256	W-SE-0044	Production Qualification Procedure	Course 2
	W-DG-0003	Engineering Evaluation Plan Template	Course 2
	W-DG-0004	EE Data Package Template	Course 2
	W-DG-0005	Engineering Evaluation (EE Data Package Checklist)	Course 2
RR 49262	W-SE-0046	Administrative IER and SIER/B Procedure	Course 3
RR 49272	W-SE-0051	Definition IER and SIER Procedure	Course 4
RR 49273	W-SE-0052	DER, AER, CER Procedure	Course 4
RR 49268	W-SE-0048	Re-evaluation Notices (RENs) Procedure	Course 5
RR 49256	W-SE-0049	Engineering Evaluation Release Procedure	Course 5
RR 49271	W-SE-0050	Qualification Evaluation Release Procedure	Course 5
RR 49298	W-SE-0047	Advanced Change Orders, Final Change Orders, and Engineering Change Requests Procedure	Course 6
RR 49257	W-SE-0045	SXN/SXR Procedure	Course 7
RR 53083	TBD	Engineering Evaluation Overview	Course 8
	W-DG-0002	EA Cheatsheet and Checklist Desktop Guide	All

Engineering Authorization System Overview

The Engineering Authorization (EA) System provides a formal communication method among M&O contractors, including configuration control and record management of EAs.

EAs authorize actions that affect product definition and related product and document information related to development, production, surveillance and dismantlement activities.
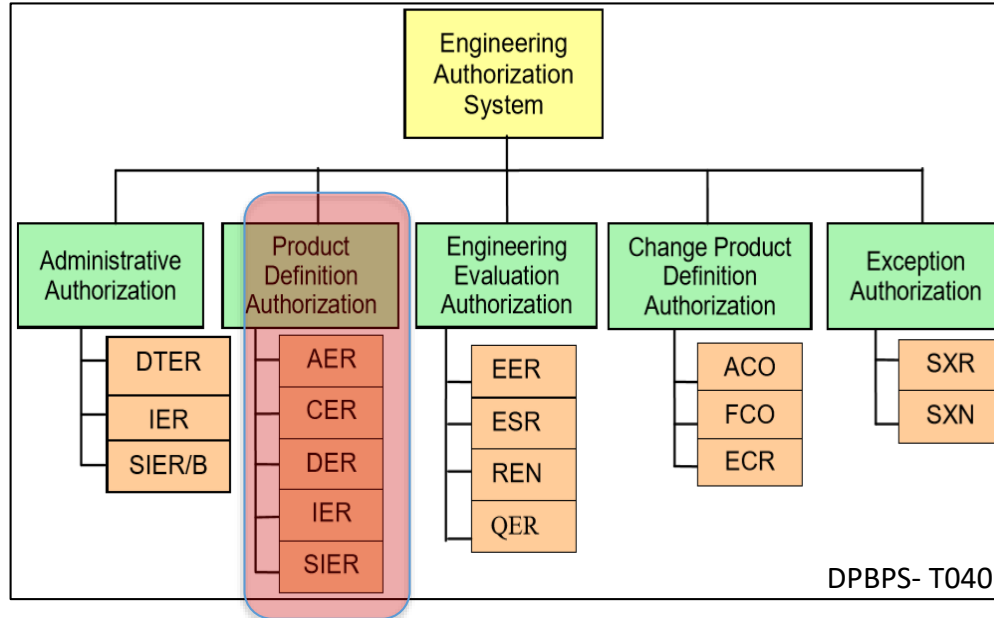
DPBPS- T040

Training Objectives

- At the end of this training, you will:
  - Recognize the five types of product definition authorizations and their usage
  - Understand the requirements
  - Understand common errors
  - Know where to gain assistance in executing engineering authorizations

- What this training will not do:
  - Authorize you to author or approve EAs
  - Train you on how to navigate the EA tool (Arbortext), PDMLink, or PRIME

Product Definition Authorization

- Weapon engineers use Development Engineering Releases (DERs), Advanced Engineering Releases (AERs), and Complete Engineering Releases (CERs) within the EA System to release product definition

- Weapon engineers use Definition Release Information Engineering Releases (IERs) to document information related to design definition, product requirements, qualification status, and production activities. Definition Release Special Instruction Engineering Releases (SIERs) are used to specify special engineering instructions for specific items

Development Engineering Release (DER)

- The DER is used to document the release of a specific issue of product definition or engineering information, and to authorize specific Production Agency (PA) actions related to design, development, or fabrication of development hardware for Design Agency (DA) use

- Design definition released under DER does not require change control releases (ACO/FCO), but is under issue control. If the definition is revised, the DER may be revised, or a new DER issued to authorize the definition for use. A Class DEV change order may authorize work to revised definition previously released by DER

- The DER may authorize PA preparation of product definition (drawings and specifications) for DA review and sign-off (the release must assign drawing numbers and titles)

Development Engineering Release (DER)

- The DER uses a special DER 12-digit numbering system.
  - Explained in DPBPS, T039, Product Definition Numbering and Control System
  - Part number for development parts = base number + development number (D##) + 3-digit suffix number

EXAMPLE   **6K3456 + D02 + 003 = 6K3456D02-003**

- If development numbering is not used, the part drawings must direct the application of restricted use marking!

This provides an additional level of control to keep development product from being confused with existing or future WR product!
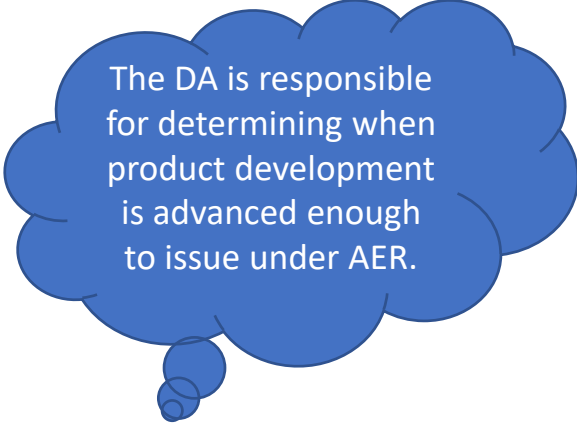
Advanced Engineering Release (AER)

- The AER is a pre-production release of the listed minimum product definition

and/or

- The AER authorizes the PA to request funding to prepare for production as specified in the AER

- The AER specifies exactly what the Production Agency (PA) is authorized to do and what the plant can or cannot produce
- The AER may authorize PA procurement of long-lead-time components
- The AER released definition is now under change control requiring the issuance of ACO/FCO to effect change

Advanced Engineering Release (AER)

- The AER may include supplemental information (hazardous materials, DA supplied items, available tooling, equipment, acceptance equipment, suggested sources of supply) related to released definition
- The AER may specify the need for Engineering Evaluation of preproduction activities including vendor qualification and material certification
- The AER may authorize the PA to prepare product definition (drawings and specifications) for DA review and sign-off

The DA is responsible for determining when product development is advanced enough to issue under AER.

Complete Engineering Release (CER)

- The CER is a mandatory release of product definition to the PA for quantity production; authorizes production to meet requirements
- All product definition necessary for fabrication and acceptance of a product must be complete for a CER to be issued for that product's definition. All subordinate product definition must also be released by CER as a prerequisite to the assembly level definition CER
- The product definition is released by CER only once, unless the mission assignment changes
- The CER must state all part numbers and/or control numbers and issues of the product definition in existence at the time of release. Unless otherwise specified, the issue stated is the minimum issue authorized for product acceptance
- Definition released by CER is under change control (ACO/FCO)

Do not CER Seven-Digit Material and Process Specifications described in T089, Seven-Digit Material and Process Specifications or T123, Public Domain Definition.

Complete Engineering Release (CER)

- The CER must be issued prior to the conclusion of an Engineering Evaluation and release of the QER.

- The CER must be released at least 6 months in advance of First Production Unit (FPU) or an AER must be issued to cover procurement of long-lead items.

- The CER for definition of product and the CER for definition of any associated DA-controlled acceptance equipment are independent, but the acceptance equipment CER must be issued prior to completion of the EE for the associated product.

Information Engineering Release (IER)

For Definition IERs
- IER released drawings do not apply to production, fabrication, or acceptance, but may be called out in the drawing set.
- The IER can be used to release ONLY specific support drawings and documents as specified in DPBPS, T030, Product Documentation Types

Documents released by Definition IER

- Documentation Standards (D-Standard)
- Design Guides (DG)
- Engineering Procedures (EP)
- Infrastructure Business Practices (IBP)
- Product Realization Standards (PRS)
- Technical Business Practices (TBP)

Information Engineering Release (IER)

- The following support drawings are released by IER at a minimum, higher level authorizations may be used:

- Reprocessing Specification (RS)
- Approved Sources List (AJ)
- Integrated Circuit Mask Set (AK)
- Laboratory Flight Test Program Document List (BA)
- System Compatibility Certification (CC)
- Compatibility Definition (CD)
- Schematic or Logic Diagram (CK)
- Certification and Qualification Plan (CQ)
- Drawing Control List (DC)
- Data Transmittal Form (DT)
- Environmental Specification (ES)
- Flow Chart (FC)
- Fault Tree (FT)
- Interface Definition (ID)
- List of Drawings (LD)
- List of Specifications (LS)
- Manufacturing Engineering Directive (MD)
- Mechanical Envelope (ME)
- Nuclear Safety Specification (NS)

- Pilot Production Program Definition (PP)
- Product Realization Documents (PR)
- Quality Plan (QP)
- Recovery Plan (RP)
- Reliability Fault Tree (RT)
- System Compatibility Document (SC)
- Sustained Engineering (SE)
- Spares List (SL)
- Specification Index (SX)
- Test Data (TD)
- Tester Safety Specification (TS)
- Use Control Requirements Specification (UR)
- Weapon System Project management Documents (WM)
- Weapon Programs Summary (WP)

Information Engineering Release (IER)

- An IER must be used to document CAGE Code changes directed by NNSA.
- The specific direction for the change must be stated in the IER.

NNSA Integrated Contractors	Site Code	Cage Code
Sandia National Laboratories California	SL	14214
Sandia National Laboratories New Mexico	SA	14213
Lawrence Livermore National Laboratory	LL	14067
Los Alamos National Laboratory	LA	88516
Kansas City Plant	KC	14061
Pantex Plant	PX	14911
Y-12 Plant	OR	88930
Savannah River Site	SR	14063
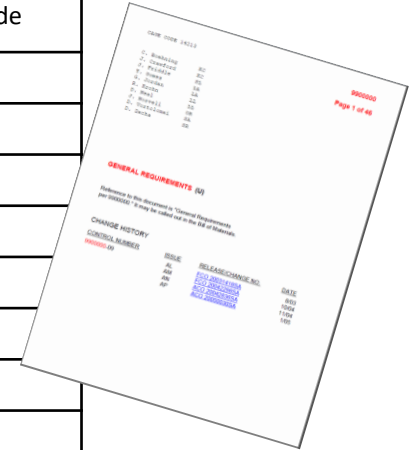
The Commercial And Government Entity (CAGE) Code is assigned by the DoD Defense Logistics Agency to identify facilities that supply information, goods, and services to the DoD. A CAGE Code is assigned to each National Security Enterprise (NSE) DA and PA site. It is placed on the document to identify the agency responsible for authorizing changes.

Special Instruction Engineering Release (SIER)

- The SIER is used to specify and authorize instructions to the PA for a specific item of product or piece of acceptance equipment.
- The SIER may be used to provide direction about the fabrication, reprocessing, testing, use, or packaging of specific product or acceptance equipment.
- In Surveillance, an SIER is used to augment a BB or BC drawing to direct the PA as to which parts to select for surveillance activities.
- The SIER may NOT be used to deviate product
- The SIER may not NOT used to specify or change product definition, with the one exception of reprocessing. The SIER is considered official reprocessing definition for non-repetitive activity required to reprocess a designated quantity of an assembly or part. The SIER must include content normally found in an RS as well as instructions to mark part with SIER number.

SIERs must be restricted by time frame, lot number, specific serial number(s), or other specific identification.

Special Engineering Release (SIER)

- If an SIER directs any special handling, storage, reprocessing, or evaluation (either destructive or non-destructive) of NNSA-accepted materials, the SIER must be approved by NNSA.
- The NNSA Field Office of the Production Agency directed to perform the work must be included in the approvals, and the Los Alamos Field Office Quality Manager should also be informed in advance of the direction being provided.

NNSA-accepted materials are government owned. Any use other than intended (generally Directive Schedule production) requires NNSA authorization.

Desktop Guide, W-DG-0002

- A desktop guide has been generated to aid in validating, authoring and approving EAs
- This desktop guide has cheat sheets for the of product definition authorizations

Weapons Program
Desktop Guide

EA Cheatsheet and Checklist Desktop Guide

Los Alamos National Laboratory • P.O. Box 1663, Los Alamos, NM 87545

Number	Revision	Effective Date
W-DG-0002U	C	August 12, 2021

DER Cheat Sheet

SAMPLE

DER Cheatsheet

Rev A

This document: W-DG-0002

- A DER is used to authorize specific PA actions related to design and development, or fabrication of development hardware for DA use
- May authorize preparation of product definition (drawings and specifications) for design reviews or for DA review and sign-off

NWC Release Date: 2019 08 01 6:30:05 MT
Category: Definition Release
Authorization Title: Development Engineering Release
Document Number: 20191234LA
Revision: 0
Part Number: 1K1234D00-00
Weapon Program: B2-1
Affected Assemblies: 1K9876
Related Authorizations: None

Code: DER
ICO:

Relate applicable ICO if applicable

Always reference the program

The next thing that is affected by this EA. Usually the next level assembly.

APPROVAL

Site	Name	Organization	Date Approved
LA	Someone Here	Q-nn	2019-08-01
LA	Someone Else Here	W-nn	2019-08-01

Author's GL must approve

DISTRIBUTION

	Site	Name	Organization	Phone Number	E-Mail
From:	LA	Someone Here	nnn	505-456-7890	zzzz@lanl.gov
To:	KC	Someone There	nnn	816-456-7890	yyyy@kcp.com
Copy To:	LA	Someone Else	nnn	505-456-7891	xxxx@lanl.gov
	KC	Another Person	nnn	816-456-7891	vvvv@kcp.com

Incorrect or wrong classified email addresses prevent proper routing

DER Cheat Sheet

REASON FOR RELEASE

1.0   To release the 1K1234 drawing for development usage.

⟵ Briefly summarize the purpose for this DER

REFERENCE AND REMARKS

1.0   Establish configuration control of initial part defining drawing.

⟵ Don't put authorization details in here

DRAWING LIST

Drawing Number	DA Suf	PA Suf	Dwg Iss	Dwg Loc	Drawing Title	Drawing Information
1K1234D00	00		A	LA	(U) CONNECTOR ASSEMBLY	NONE

⟵ DERs must use development numbering (1K1234D00-000)

AUTHORIZATION DETAILS

1.0   This DER authorizes KCNSC to create the initial development lots in support of the B2-1 ALT 999 program.

Minimum Required Approvals per W-SE-0052U

Usage	System Group Office	GTS[1] Group Office	Detonator Group Office	Author's Group Office
Product Definition	X			X
GTS[1] Definition		X		X
Detonator Definition			X	X
1 Gas transfer system (GTS)				

SIER Cheat Sheet

SAMPLE

References:		
T040	**SIER Cheatsheet**	**Rev C**
T049		
W-SE-0051		This document: W-DG-0002

- SIERs are used to specify special engineering instructions against a specific item or product or acceptance equipment and approves specific actions by the PA or provides information regarding the fabrication, reprocessing, testing, use, packaging, etc. of the item. [2]

NWC Release Date: 2019 05 01 6:30:05 MT
Category: Definition Release
Authorization Title: Special Instruction Engineering Release
Document Number: 20190001LA   **Code:** SIER
Revision: 0
Part Number: 1K1234-00   **ICO:** None
Weapon Program: B2-1
Affected Assemblies: 1K9876
Related Authorizations: N4321OR2019LA

- Relate applicable ICO if applicable. [3]
- The next item that is affected by this SIER. Usually the next level assembly. [4]
- Other EAs as applicable. [5]

APPROVAL

Site	Name	Organization	Date Approved
LA	Someone Here	Q-nn	2019-05-01
LA	Someone Else Here	W-nn	2019-05-01
LA	W-10 Someone	W-10	2019-05-01
LA	W-NES Someone	W-NES	2019-05-01

- Author's Group Office, at a minimum. [6]
- EAs that impact Pantex nuclear explosive operations must be approved by Weapon Response (W-10) and W-NES. Contact W-10 and W-NES to review EA details for potential impacts. [7]

DISTRIBUTION

	Site	Name	Organization	Phone Number	E-Mail
From:	LA	Someone Here	nnn	505-665-1234	zzzz@lanl.gov
To:	OR	Someone There	nnn	865-574-1234	yyyy@y12.gov
Copy To:	LA	Someone NNSA	nnn	505-667-1234	xxxx@nnsa.gov
	PX	Another Person	nnn	123-576-1234	vvvv@cns.gov

- Incorrect or wrong classified email addresses prevent proper routing. [8]

REASON FOR RELEASE

/Rev 0/ (2019-05-01)
1.0   Provide Y12 with reprocessing instructions for Lot 7 of 1K1234-00

- Briefly summarize the purpose for the SIER. [9]

REFERENCE AND REMARKS

1.0   NAP 401.1 requires NNSA approval for reprocessing. Y12 Field Office approval has been received in Memo #2019-03

- Limit to reference information, as applicable. [10]

DRAWING LIST

Drawing Number	DA Suf	PA Suf	Dwg Iss	Dwg Loc	Drawing Title	Drawing Information
1K1234	00		B	LA	(U) GADGET	NONE

- List all applicable product(s) or specification(s). The suffixed part number is not placed in the Drawing Number field. [11]

AUTHORIZATION DETAILS

1.0   Lot 7 shipped from Y12 was found to have foreign material by Pantex upon receipt. This SIER provides reprocessing instructions to authorize Pantex to perform the described cleaning process to remedy the condition. RS1K1234 does not address this condition, necessitating this special instruction.

2.0   Clean all parts with a cotton cloth until foreign material is removed and can not be seen without magnification.

3.0   Successful completion of this SIER will result in parts that are reaccepted by NNSA at Pantex.

4.0   Upon completion of the cleaning process, NNSA will evaluate the parts for reacceptance. The serial numbers that are reaccepted must be documented in a Pantex-authored revision to this SIER.

- This contains the content to be communicated (justification, reasoning, disposition, history, context, supporting information, etc.). Consider updating product definition and process documents to reduce the need for future SIERs. [12]

Minimum Required Approvals per W-SE-0046U

EA	Usage	Division Office	System Group Office	Production Liaison Group Office	GTS[1] Group Office	Detonator Group Office	Weapon Response Group Office	Author's Group Office
Administrative IER	Not Weapon Response							X
	Delegation of SXR authority to PA	X	X	X				X
	Weapon Response	X	X		Add[2]	Add[2]	X	X
SIER/B	Product	X	X	X				X
	GTS[1] Product	X	X	X	X			X
	Detonator Product	X	X	X		X		X

1. Gas transfer system (GTS)
2. A Weapon Response IER that pertains to GTS or Detonators should include the appropriate group office in the approvals. Similarly, a Weapon Response IER that pertains to another component should include the relevant group office for that component in the approvals.

Common Error: IER, SIER, or SXR?

- An IER provides no authorizing instruction
- An SIER provides one-time instruction or non-repetitive reprocessing definition that does not contradict existing requirements
- An SXR (addressed in section 7 of this training) provides authorization to deviate from existing requirements or authorizes use of items that have deviations from requirements. Examples:
  - DA needs additional data to make a decision on a non-conformance
    - Issue an SIER to direct the PA to make an additional measurement or perform photography, etc. and provide data

  - PA measurement capability is down but has requirement to collect and/or report data to DA; data is not for acceptance and production schedule warrants moving forward.
    - Issue an SXR to authorize the deviation from requirements

  - PA is having issues controlling a feature on a part in a qualified production process. We would like them to take extra measurements using approved processes at various points in the production process
    - Issue an SIER to direct the PA to perform the extra measurements and provide the data

Summary

DER: Release Development Definition
– *Authorize development work*
– *Definition under issue control*
– *Special numbering system*

AER: Release Pre-production Definition
– *Authorize long-lead procurement*
– *Definition under change control (ACO/FCO)*

CER: Release Complete Definition
– *Authorize production*
– *Definition under change control (ACO/FCO)*

IER: Release Certain Documents and Support Drawings
– *Releases drawings that do not apply to production, fabrication or acceptance*
– *Document CAGE code changes*

SIER: Authorize special instruction
– *Official reprocessing definition for non-repetitive (off-normal) situations*
– *Augment BB or BC drawing to specify items selected for surveillance*

References

Number	Title	Website
DBBPS -T040	*Engineering Authorization System*	https://dpbps.sandia.gov/SitePages/homepage.aspx
W-SE-0008U	*Engineering Authorization System*	https://int.lanl.gov/org/ddw/aldw/office-design-agency-quality/design-agency-procedures/system-engineering-procedures.shtml
W-SE-0052U	*DER, AER, CER Procedure*	https://int.lanl.gov/org/ddw/aldw/office-design-agency-quality/design-agency-procedures/system-engineering-procedures.shtml
W-SE-0046U	*Administrative IER and SIER/B Procedure*	https://int.lanl.gov/org/ddw/aldw/office-design-agency-quality/design-agency-procedures/system-engineering-procedures.shtml

Resources

When you have issues or questions regarding the Engineering Authorization System, there are resources you can go to:

- ALDW Office of Design Agency Quality (ALDW-DAQ)
- Production Liaison Group (W-8)
- Engineering Authorization Team (W-11)
- W- and Q- Division Group Leaders
- This training

Acronyms

DTER	Drawing Transfer Engineering Authorization
IER	Information Engineering Authorization
SIER/B	Special Instruction Engineering Release/B Authorization
AER	Advanced Engineering Authorization
CER	Complete Engineering Authorization
DER	Development Engineering Authorization
SIER	Special Instruction Engineering Authorization
EER	Engineering Evaluation Authorization
ESR	Evaluation Status Release

Acronyms (continued)

REN	Reevaluation Notification Authorization
QER	Qualification Evaluation Authorization
ECR	Engineering Change Request Authorization
ACO	Advanced Change Authorization
FCO	Final Change Authorization
SXN	Specification Exception Notice Authorization
SXR	Specification Exception Authorization
DA	Design Agency
PA	Production Agency
DPBPS	Defense Programs Business Process System
M&O Contractors	KCNSC / LANL / LLNL / NNSS / PX/ SNL / SRS / Y-12

Course 4: Complete